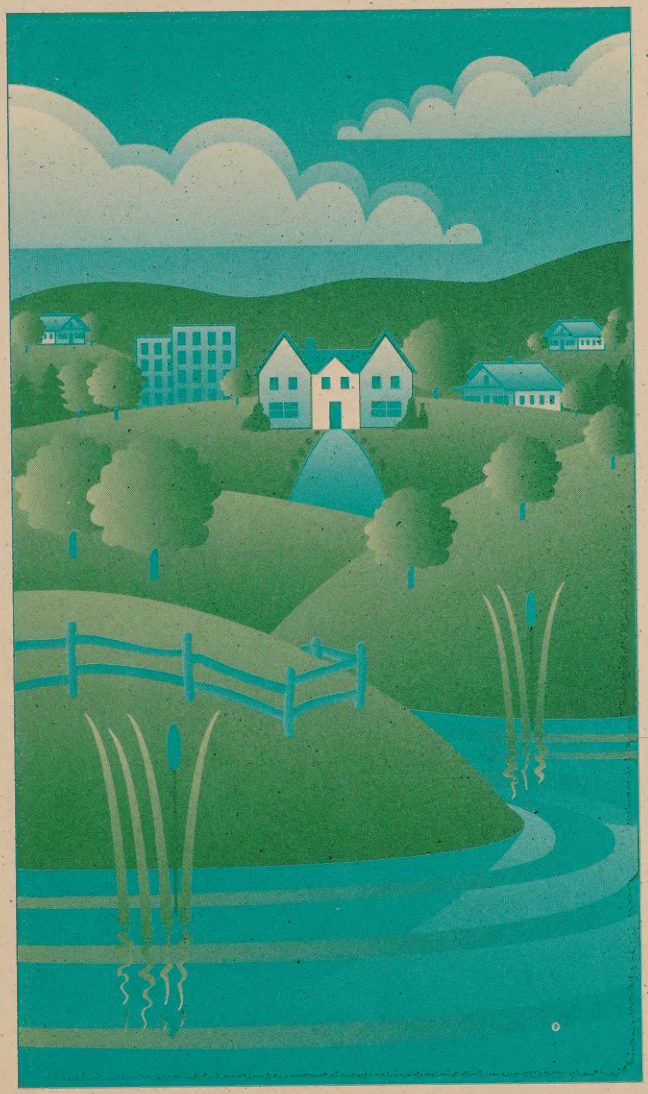
VOLUME 5

ENVIRONMENTAL LIVING:

PROTECTING THE ENVIRONMENT...

IN THE GREAT OUTDOORS



MINISTRY OF
ENVIRONMENT AND ENERGY

Ontario

VOLUME 5

ENVIRONMENTAL LIVING:

PROTECTING THE ENVIRONMENT...

IN THE GREAT OUTDOORS

For additional copies of this volume, contact:
Ministry of Environment and Energy
135 St. Clair Avenue West
Suite 100
Toronto, Ontario
M4V 1P5

ISBN 0-7778-1068-9 (5 v. set)
ISBN 0-7778-1073-5 (v. 5)

PIBS 2319E

Ontario

Table of Contents

Environmental Living: Protecting the Environment ... in the Great Outdoors

About "Environmental Living"

Would you like to do something to help the environment — but do you feel overwhelmed by the magnitude of the problems? Do you wonder if your efforts as an individual can make a difference?

Take heart. "Environmental Living" was written for all those people who want to protect the environment but need to know how and where to get started.

The pages of "Environmental Living" describe how to conduct your everyday activities in ways that are environmentally friendly. It's a "primer" on environmental topics that affect people who live in the city, people who live in the country and people who spend time in the great outdoors. Everything is explained in simple, easy-to-understand, easy-to-remember language.

Do you want to know how to cut down on the garbage you generate? How to start a compost heap? How to drive your car to improve its energy efficiency, lengthen its life and reduce the pollution it creates? "Environmental Living" shows you how easy it is to do all these things.

Do you live in the country — or are you thinking about buying a cottage or rural property? Do you want to learn how to look after your septic tank system? How to test for bacteria in your well water? How to build an environmentally friendly dock? "Environmental Living" looks at all these topics, and more.

Do you spend a lot of time in the great outdoors? Do you want to know how to avoid insects? What to do about zebra mussel infestations in the Great Lakes? If it's safe to eat that fish you caught? "Environmental Living" has the answers.

Living environmentally doesn't mean you have to become an environmental expert. You don't have to spend a lot of money or time. Nor do you have to make wholesale changes to your life.

No single, dramatic act by one person can save this planet. But all of us, doing a lot of simple, commonsense things, *can* save it — a little bit at a time.

What You'll Find in "Environmental Living"

"Environmental Living" is an unusual concept in publishing. It is one book, but it is published in five separate sections. You, the reader, decide which topics you want to read about, and you need order only those sections.

This means "Environmental Living" uses less paper, and you, the reader, don't have to wade through pages and pages of information you don't need.

To order any section of "Environmental Living", contact the Ministry of Environment and Energy by telephoning the Public Information Centre in Toronto at (416) 323-4321 or toll-free at 1-800-565-4923.

Each section of "Environmental Living" consists of several chapters that share a common theme. Every section and chapter is self-explanatory but, as you read them, you may come across references to other sections or chapters that can give you related or more detailed information. Those sections and chapters will be referred to by their complete titles, to make it easy for you to order that section.

At the end of each chapter is a list of publications you may want to read to get even more detail or technical background information; there's an explanation of where and how to obtain copies of those publications.

Here's a list of chapters in each section (a description of the chapter's contents follows, in brackets).

Environmental Living: Protecting the Environment ... in Your Home

There's information of interest to everyone in this section, which has chapters about handling waste, non-toxic cleaning, how to drive to minimize pollution, and what you can do about global issues such as acid rain and global warming.

- "What a Load of Garbage!" The 3Rs
  (Describes the 3Rs and what to do with your garbage);
- The 3Rs, Take Two: Little Things Mean a Lot
  (Quick tips on practising the 3Rs);
- Cleaning Without Chemicals: Recipes for a Non-Toxic Planet
  (Making your own non-toxic cleaning products);
- Cleaning Without Chemicals, The Sequel: The Non-Toxic Cleaning Kit (Quick cleaning tips);
- Not Down the Drain: What to do With Household Hazardous Waste
- Water, Water Everywhere
  (How to conserve water);
- Your Car and the Drive for a Healthy Environment
  (How your driving habits affect the environment);
- Good News about Acid Rain
- Global Warming: The Gloves are Off
  (What you can do about global warming).

What You'll Find in "Environmental Living"

Environmental Living: Protecting the Environment ... in Your Yard and Garden

Do you want environmental tips you can put into practice in your backyard? Read these.

- A Down-to-Earth Guide to Composting and Vermicomposting
- A Grassroots Look at Your Lawn (Growing a lawn that looks after itself);
- Those Pesky Bugs! And Other Small Hazards of the Great Outdoors (Controlling insects);
- Using Insecticides Safely
- Too Close for Comfort: What to Do About Nuisance Animals.

Environmental Living: Protecting the Environment ... when Building or Buying Your Dream Cottage

If you are buying a cottage or rural property, read these.

- Before You Take the Plunge: Rural Life is Different (Adjusting to country living);
- Bylaws and Buildings: Unravelling the Red Tape (Building and zoning laws and permits);
- Dig a Well to Tap into Groundwater Supplies (How to construct a well);
- This is a Story about Sewage. Skip It and You'll Be Sorry (Disposing of sewage when there's no municipal sewer system);
- Landscaping You Can Live With (Landscaping to protect and blend into the environment and to attract wildlife).

Environmental Living: Protecting the Environment ... at the Cottage

Water quality (both groundwater and lake water) is emphasized in this section.

- Testing the Waters: Bacteria and Your Drinking Water (Getting safe drinking water from your well);
- Every Cottager's Covert Operation: Maintaining that Septic Tank System (How to run your septic tank system trouble-free for years);
- Keeping Aquatic Plants Under Control for Boating and Swimming
- Stop Old Age from Ruining Your Lake (Avoiding eutrophication of your lake);
- All the Dirt on Shoreline Alterations ("Do's and don'ts" of changing the natural shoreline);
- Gimme Shelter: Building Docks and Boathouses (Environmentally friendly structures).

Environmental Living: Protecting the Environment ... in the Great Outdoors

This section will interest outdoors enthusiasts.

- Campfires and Cookouts (Fire safety);
- Could Swimming in Your Lake Make You Sick? (Diseases and parasites that affect swimmers);
- Great Lakes! The Zebra Mussel Story (The spread of zebra mussels in Ontario's waterways);
- Boating and the Environment
- Goin' Fishing: Should You Eat the Catch of the Day? (Contaminants and the consumption of sport fish).

Campfires and Cookouts

Everyone enjoys a fire when they're camping or cottaging. But be careful. It's all too easy for a campfire to get out of control. Most forest fires aren't caused by natural events, such as lightning — they're accidentally started by people.

Open fires cause air pollution. Smoke and odors from fires can be irritating to people's eyes and can aggravate breathing problems. The Ministry of Environment and Energy investigates air pollution complaints and can take action under The Environmental Protection Act.

Getting The Campsite Ready

- Choose the site carefully. Burn only in a cleared area, on mineral (sand and gravel) soil. Don't locate your fire where trees or rooflines overhang the burn site, or near firewood, lumber, buildings, decks, or fuel tanks.
- Never start a campfire in the middle of a hot, dry, windy day — the risk is great that the fire could get out of control, or that sparks could start an unwelcome fire. Burn only on cool, damp, calm days. (Mornings and evenings are probably the best times to take advantage of these conditions.)
- Don't burn on rainy or foggy days — the moisture in the air stops smoke from dispersing.
- Plan a campfire that's a manageable size.
- Burn only dry materials. Don't burn your garbage.
- Don't use wood that has been treated with chemical preservatives (such as creosote). Don't put petroleum products, plastics or rubber in the fire, either. All these things may, when burned, release dangerous toxic chemicals. The smoke or fumes may contain cancer-causing agents.
- Don't throw aerosol cans into a fire – they'll explode!
- Don't allow anything into the immediate fire area that could ignite or catch fire. That includes your own clothing — some synthetic materials are highly inflammable.
- Plan to stay with the fire at all times until it's completely extinguished and drowned.
- Be ready to clean up properly. Ashes and coals should be put in a metal container and soaked with water till they're cold, then buried in a pit of mineral soil.

More for You to Read

To order the Ministry of Environment and Energy publications in the list below, telephone the Public Information Centre in Toronto at (416) 323-4321 or toll-free at 1-800-565-4923. Please use the Public Information Bank System (PIBS) number to order publications.

To order the Ministry of Natural Resources publications in the list below, telephone the Public Information Centre in Toronto at (416) 314-1553.

Before you burn grass and debris ... Brochure. Ministry of Natural Resources. 5 pp. ISBN 0-7729-5716-9.

Open Burning. Information sheet. Ministry of Environment and Energy. PIBS 631b.

Protect your forest home or summer cottage. Brochure. Ministry of Natural Resources. ISBN 0-7729-5719-3.

Could Swimming in Your Lake Make You Sick?

"Going for a swim" is a ritual of summer. Whether you're at the cottage for the season or just visiting the beach for the day, swimming is good healthy fun.

But can that swim make you sick? How do you know to "come on in — the water's fine"? And what can you do to keep water from becoming polluted? Read on to find out.

Why Swimmers Get Sick

You can become ill after swimming in a lake if the water contains high levels of bacteria, particularly fecal coliform and fecal streptococci.

As you swim, the bacteria invades your body, and you can get gastroenteritis (stomach flu), dysentery, diarrhea, or infections of the skin, eye, ear, nose and throat.

So you arrive at the local beach, and it's "been posted" — there are warning signs telling you not to swim. Why? It's usually because fecal coliform is present in densities that can endanger your health, according to your local health unit.

Fecal coliform (FC) can be measured in water samples; it is counted and reported as the number of organisms counted in 100 millilitres of water. In Ontario, the Ministry of Environment and Energy and the Ministry of Health have issued a minimum quality guideline: "Safe" water must contain less than 100 FC in 100 millilitres of water. Local medical officers of health may apply even tougher standards than that.

(To give you an idea how strict a 100 FC limit is, consider most other provinces set their guidelines at 200 FC. There's less than a 1.5 per cent chance of stomach disorders with 200 FC in 100 millilitres of water.)

When the FC concentration decreases to a point that your local medical officer of health considers safe, the beach will be re-opened. This can take a few days.

How does the bacteria get into the water? Fecal coliform and streptococci are found in the stool of almost all warm-blooded animals. When the stool washes into lake water, it raises the water's bacterial level, contaminating it.

Obviously, it can occur naturally. Pet and wildlife droppings may wash into water, and large numbers of water birds may foul the beach.

It may come from farms — manure may drain into streams or drainage ditches.

But mostly, the bacteria comes from people, and gets into the water from sewer overflows, badly constructed sanitary sewers, illegally connected basement bathrooms, inadequately treated sewage, faulty septic tank systems, grey water from boats, or from stormwater runoff. Contamination is so common that in some Ontario cities, beaches are posted as a matter of routine after any heavy rainstorm.

And the same weather that sends you heading for the beach, does wonders for bacteria. The hot weather encourages them to multiply even more.

You Can Keep Your Beach Swimmable

Rainfall runoff happens when heavy rain or melting snow "flushes" the land around a lake, carrying contaminants into the water. The contamination shows up from 12 to 48 hours after the precipitation. You can help prevent coliform and streptococci from reaching those waters.

- Pet waste, believe it or not, is a big source of bacteria in storm water. Observe your local "stoop 'n' scoop" bylaws.
- Cut down on the amount of water you use. Sewage treatment plants sometimes have problems coping with the sheer volume of water that must be treated. Less wasted water means less likelihood of untreated or poorly treated sewage getting into lakes and rivers.
- Adding a new washroom? Make sure it's connected properly to sanitary sewer pipes. If you're using a septic tank, be sure it can handle the extra materials.
- Adjust your eavestroughs to carry rainfall onto your lawn — that will reduce the amount of rain water going directly into sewers.

And ... Special Advice for Farmers (and Cottagers)

- Fence livestock away from streams.
- Make a point of containing waste materials from feedlots and manure piles.
- Work out the exact nutrient requirements for your crops. Don't over-fertilize.
- Put in "strips" of vegetation to act as a buffer between your cropland and natural waterways, as well as municipal drains. (Vegetation also cuts down on soil erosion.)
- As well, leave natural vegetation between your house and waterbodies, to absorb runoff and filter stormwater.
- Be sure your septic tank system is big enough to meet your needs. Maintain it properly. Older systems may not conform to current legislated standards and may need to be replaced; be sure your septic system is current.
- Plant grass over your septic tank tile bed and let the sun and wind do their bit to help evaporation.

Other "Bugs" that Bother Swimmers

Giardia

Also known as "beaver fever" or "the purple burps", giardia is a common parasite that enters your stomach as a cyst, attaching itself to the wall of the intestine. It causes diarrhea, nausea, buildup of gas and vomiting; if left untreated, it can continue for more than a year.

Giardia is picked up from direct contact with human or animal feces, or from poorly treated drinking water contaminated by feces. Don't swim in a pond or water body where beavers and muskrats live; they defecate in the water and can quickly contaminate it.

At the cottage, or when you're camping, canoeing, or hiking, make sure you dispose of sewage properly.

"Swimmer's Itch"

Swimmer's itch is a temporary infection. It's caused by the tiny colourless flatworm larva called schistosome cercariae. These larvae usually prey on freshwater snails and waterfowl. When they penetrate a swimmer's skin, they die, leaving an itching, raised, red spot that lasts several days. Simple prevention measures:

- Immediately after swimming, rub down briskly with a towel. The larvae can't penetrate the skin until the water evaporates.
- Or, take a freshwater shower right after swimming.
- Swim in deeper water. Onshore winds tend to concentrate the larvae in the shallows.

Leeches (Bloodsuckers)

Leeches are flat worm-like animals that usually feed on worms, snails, insect larvae and other small aquatic animals. Sometimes, you'll find one attached to *you.*

They live in shallow, protected water (where they're concealed by aquatic plants) or under stones, logs and other debris. They're strong swimmers and are attracted to water disturbances around docks and swimming areas.

You're most likely to come into contact with them on hot summer days. (In winter they burrow in mud just below the frost line.)

To keep leeches in check, cottagers should keep their beaches clean. Remove debris, stones, logs and some of the plant life where the water is warm and shallow.

You can also trap leeches in heavily infested areas. Use a metal can with a reusable lid, drilled with small holes matching the size of leeches typical for your area. Bait the trap with raw meat. Put it in shallow water. When the leeches feed, they'll get bigger. They'll be trapped in the can and you can destroy them.

More for You to Read

To order the Ministry of Environment and Energy publications in the list below, telephone the Public Information Centre in Toronto at (416) 323-4321 or toll-free at 1-800-565-4923. Please use the Public Information Bank System (PIBS) number to order publications.

Inquiries about the Environment Canada publications in the list below should be directed to the toll-free number 1-800-668-6767; or call the Toronto office at (416) 973-6467.

Clean Water - Life Depends on It! Fact sheet. Environment Canada, Conservation and Protection. Water 3. ISBN 0-662-17338-4.

CURB (Clean Up Rural Beaches) Program. Information sheet. Ministry of Environment and Energy. PIBS 1665b.

Water - Nature's Magician. Fact sheet. Environment Canada, Conservation and Protection. Water 1. ISBN 0-662-18080-1.

What is Giardia? Pamphlet. Ministry of Health. ISBN 0-7729-2791-X.

Why Beaches are Posted. Pamphlet. Ministry of Environment and Energy. PIBS 1550b.

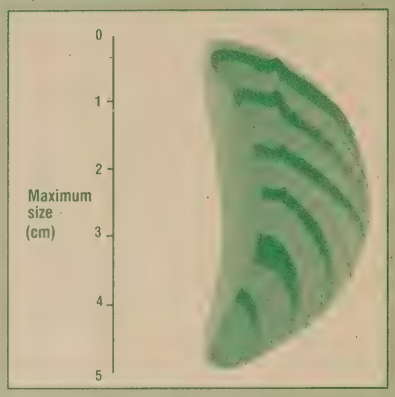
Great Lakes! The Zebra Mussel Story

If you swim, fish, or boat in the Great Lakes, you've probably come across zebra mussels. If you haven't, it's probably just a matter of time before you do. Zebra mussels have become major pests in the Great Lakes since they were accidentally introduced to the chain of water bodies around 1986. They're also expanding their territory — they've been found in lakes in the Muskokas and Kawarthas as well as in Ontario's two canal systems.

These Clams are Open for Business

You never find just one zebra mussel — a colony numbers in the tens of thousands. They cling to underwater surfaces such as boat hulls, motors, buoys, docks, water intake pipes and screens, rocks and reefs. By the end of the boating season, your boat may be dragging in the water as it carries thousands of zebra mussels along for the ride.

Zebra mussels are freshwater molluscs (clams) and have brown, yellow and white stripes. They live for up to five years and grow up to five centimetres (two inches). They're incredibly prolific — a female adult can lay tens of thousands of eggs. The eggs hatch to form larvae, or veligers, which are microscopic until they attach themselves to a hard surface and begin forming a shell. That's when problems begin.



Zebra Mussel

Small in Stature, These Clams Have Muscle

Colonies of zebra mussels have been found clinging to municipal water intake pipes, pipes for power plants and industrial pipes. In one case, zebra mussels took up half the volume of a pipe carrying water from the Detroit River to an industrial plant in Windsor in 1989. And in Michigan that same year, several *tonnes* of mussels were scraped off the outer screens of a power plant every single day throughout the summer.

Mussels can damage the engines of boats. Their sheer collective weight increases drag and fuel consumption. They can clog your boat's cooling system.

Fish and mussels don't mix — at least, not where habitat is concerned. Mussels can ruin spawning shoals for sport fish and drive the light-sensitive walleye into deeper waters.

Swimmers will find mussels' sharp shells cut their feet. And decomposing mussels washed up on shore have a terrible smell.

Since 1986, when they probably came over from Europe in a freighter's ballast tank, mussels have spread throughout the Great Lakes. They've been found in Lake St. Clair, Lake Erie, the Welland Canal, Lake Ontario (near Burlington, Mississauga, Bath and Picton), in Green Bay of Lake Michigan, in Duluth Harbor of Lake Superior, in the Niagara River and in the St. Lawrence River (near Prescott and Cornwall). More recently, they've moved into other popular boating areas such as Lake Simcoe and the Trent Severn Waterway and the Rideau Canal.

Keeping a Lid on Zebra Mussels

How are zebra mussels spread? Mostly by people. The microscopic veligers, especially, can be carried far afield by unwitting carriers. Here's a list of ways you might never think you'd be spreading zebra mussels inland:

- in baitfish buckets
- on boat hulls, in engines and ballast tanks
- on float plane pontoons
- on fishing gear
- on scuba diving equipment
- in boat trailer frames.

It's likely zebra mussels will continue to spread, hitching rides with recreational boaters and anglers, unless people are careful not to transport them. (It was once thought that parts of Lake Superior and lakes in the Precambrian Shield were not warm enough, or didn't contain enough calcium, for zebra mussels to survive in those waters. However, mussels are beating the odds — they *have* turned up in lakes containing those lower calcium levels.)

A number of provincial agencies are involved in a zebra mussel program that includes research, monitoring and studies of possible control measures. But control measures may well start with the people who are the most likely to transport and spread zebra mussels to new areas — the recreational users of the Great Lakes.

What Boaters Can Do

Motor Maintenance

- Flush the motor by running it at high speed for 10 minutes, at least twice a week in summer and once a week in spring and fall.
- Tip the outboard up and out when it's not in use so water can drain and mussels can't become attached to it. Check cooling water inlets and spaces around the propeller; remove mussels every time. Watch when you start up — is there less cooling water being discharged?
- Pull out screens, check intakes regularly and clean and replace components.
- Make it a habit to watch temperature gauges. If temperatures seem to be increasing, check the cooling water intake hoses.

Get the Hull Story

- Inspect your boat often during the season and scrape zebra mussels off regularly. If your boat's hull seems grainy, veligers have attached themselves to your boat. Get them off using hot (40° Celsius or 110° Fahrenheit) water.
- Haul your boat out of the water and onto a rack when you're not using it.
- When you take your boat out of the water, drain the propulsion system, bilges, bait well, coolers and anchor locker. Flush everything with hot tap water.
- Wash the outside of the hull before leaving the infested lake. A mild chlorine solution of 15 millilitres (one tablespoon) of bleach in 4.5 litres (one gallon) of water will kill veligers, though not adult mussels.
- When your boat's out of the water, a few hot dry days in the sun will kill adult zebra mussels. You'll still need to scrape.

What Fishing Enthusiasts Can Do

- There could be more than baitfish in that bucket you're hauling. Veligers — mussel larvae — are invisible to the human eye. Don't carry baitfish from the Great Lakes to another water body.
- Don't carry water from one lake to another.
- Wash down your fishing gear using hot water or a mild chlorine solution like those used by boaters.

More for You to Read

To order the Ministry of Natural Resources publications in the list below, telephone the Public Information Centre in Toronto at (416) 314-1177.

Zebra Mussels Boater's Guide. Pamphlet. Ministry of Natural Resources. ISBN 0-7729-8708-4.

Zebra Mussels: What You Should Know. Pamphlet. Ministry of Natural Resources. ISBN 0-7729-7503-5.

Boating and the Environment

Putting the boat in the water is a sure sign of summer — and boating is becoming more popular with every season. Ontario's lakes can see some heavy traffic in the warm-weather months!

Some vessels may have a galley with a sink for dish-washing. Many even have toilets. Power boats carry gasoline and oil. How can boaters protect the quality of the lake water from potential contamination?

What to Do About Your Drinking Water Supply

Your freshwater tank should be filled from a safe supply, such as municipally treated water. The tank itself should be disinfected. To do this, drain it and refill it with water — for each litre of water, add 5 millilitres of household bleach (or, one teaspoon per gallon). Leave this in the tank at least overnight, drain and flush with safe water.

Clean the tank this way twice each month.

If you suspect the safety of the water that you put in the tank, you can purify it by chlorinating it. Add 0.1 millilitres (two drops) of five per cent unscented household bleach to each litre of water when you fill the tank. Double the bleach if the water looks cloudy.

You can't keep treated water indefinitely. Water that's been treated with chlorine is good for a few days, refrigerated. Distilled water should be used in two days.

What to Do with Waste Waters

Boaters in Ontario waters must comply with provincial regulations regarding waste waters. All boaters must contain "black" water (from the toilet) until they discharge it at an approved pump-out facility. Depending on the type of vessel, some boaters must also contain and correctly discharge "grey" water (from cooking, washing and from the bilge).

You can't use a portable toilet on board unless it's secured to the boat and adapted to a deck fitting for a shore-based pump-out. The toilet must be constructed of structurally sound material, be correctly installed and be of adequate capacity for its expected use. Waste must be stored in holding tanks or incineration systems.

All marinas in Ontario, including yacht clubs, must provide facilities to pump out waste. (They must also provide litter containers for boaters.)

Boating with the Environment in Mind

Boating means different things to different people. Some people prefer "low impact" boats — canoes, sailboats, rowboats, or quiet, low-horsepower power boats. Others prefer large-horsepower, high-speed power boats; keep in mind these use a lot of fuel and can be very noisy. The kind of boat you choose — whether you rent one for a weekend or buy one to use at your cottage — will certainly put a different flavor on your recreational experience, and those of people nearby.

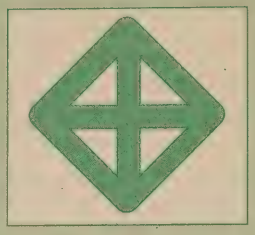
Filling the Gas Tank

Fuel spills — even minor ones — from accidental handling do affect the water.

Gasoline and oil affect micro-organisms, including phytoplankton (algae) and zooplankton (fish larvae and small crustaceans); they are the main food source for fish.

Normal gasoline exhaust and oil discharges have little effect on the aquatic environment. It's more important to be careful when refuelling. Fill a portable tank well away from the water. To refuel on board:

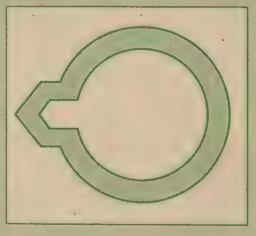
- Moor the boat securely. Shut off engines and put passengers and portable tanks ashore.
- Close all windows and hatches. Don't smoke; extinguish all open flames. Don't use electrical switches.
- Put the nozzle all the way in the filler pipe. Fill carefully to avoid blow-back. Wipe up spills. Don't overfill. Allow some space for gas to expand inside the tank in hot weather.
- Turn on the blower for at least five minutes. Check for vapor and odors.



Prohibition of all vessels

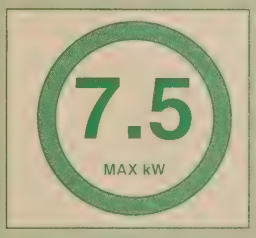
Prohibition of all power-driven vessels

Prohibition of all power-driven vessels except those driven by a battery-powered electric propulsion motor.



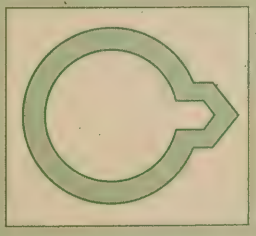
Outer directional rings indicate the boundary of the waters to which a prohibition applies and the side of the boundary to which it applies

Prohibition on operating a power-driven vessel in excess of (in this example) 9 kilometres per hour over the ground



Prohibition on operating a vessel with a motor larger than the posted maximum kilowatts (7.5 kW is equivalent to 10 h.p.)

Prohibition on operating a power-driven vessel for the purpose of towing a person on water skis, a surf-board or any such equipment



Outer directional rings indicate the boundary of the waters to which a prohibition applies and the side of the boundary to which it applies

Zebra Mussels in the Limelight

Zebra mussels are literally a growing problem in the Great Lakes and in some of our inland lakes. For information on how boaters can combat the spread of these tiny clams, read "Great Lakes! The Zebra Mussel Story".

More for You to Read

To order the Ministry of Environment and Energy publications in the list below, telephone the Public Information Centre in Toronto at (416) 323-4321 or toll-free at 1-800-565-4923. Please use the Public Information Bank System (PIBS) number to order publications.

To order the Ministry of Natural Resources publications in the list below, telephone the Public Information Centre in Toronto at (416) 314-1177.

Boating Regulations and Information. Booklet. Ministry of Natural Resources. ISSN 0840-8521.

Don't Rock the Boat (10 Tips on Better Boating). Brochure. Ministry of Natural Resources. ISBN 0-7729-5776-2.

Marine Pump-Out Stations. Booklet. Ministry of Environment and Energy. ISBN 0-7729-5714-2. PIBS 591b.

Goin' Fishing: Should You Eat the Catch of the Day?

Are you planning on "goin' fishing"? With more than 260,000 freshwater lakes in Ontario, you can take your pick of places to cast your line and catch your dinner!

You may hesitate to stoke the fire and bring out the skillet, though, because you've heard that fish can contain contaminants such as mercury and dioxins.

How can you be sure your catch is safe to eat?

Fish Are Monitored for Contaminants

The Ministry of Environment and Energy and the Ministry of Natural Resources jointly take samples of, and also retest, fish from more than 1,500 Ontario lakes. The tests monitor contaminant levels in sport fish and the data can be used to advise anglers how much fish is safe to eat.

How are lakes chosen for the sport fish contaminant monitoring program? Lakes are selected for at least one of these reasons: They're popular angling areas; they're a major local food source; a probable source of pollution is nearby.

You can ask to have your lake tested, although not every lake suggested will be chosen. To nominate your lake, write to either ministry at the district office nearest that lake.

The monitoring program has been carried out since the 1960s, when people became concerned about the effects of DDT (an insecticide) on fish. Next, testing for mercury began in 1969. Today, the monitoring program can test for more than 60 contaminants, including PCBs, dioxin and mirex.

The results are used to prepare the biannually updated "Guide to Eating Ontario Sport Fish", prepared and distributed by both the Ministry of Environment and Energy and the Ministry of Natural Resources. The guide is free. In chart form, it identifies the lake tested, the fish types tested from that lake, which contaminants the fish were tested for, the size of the fish tested; the guide offers advice on how much of that fish is safe to eat.

Consumption guidelines for fish caught by anglers

Consumption Frequency					
Long-term consumption	No restriction	0.2kg/wk. (0.5 lb./wk.)	0.1 kg/wk. (0.3 lb./wk.)	1 or 2 meals/month 0.5 kg/mo. (1 lb./mo.)	None
One-week vacation	No restriction	10 meals 2.3 kg (5 lb.)	7 meals 1.5 kg (3 lb.)	1 or 2 meals 0.5 kg (1 lb.)	None
Two-week vacation	No restriction	5 meals per wk. 1.3 kg/wk. (2.8 lb./wk.)	4 meals per wk. 0.8 kg/wk. (1.9 lb./wk.)	1 or 2 meals/wk. 0.5 kg/wk. (1 lb./wk.)	None
Three-week vacation	No restriction	4 meals per wk. 1 kg/wk. (2.1 lb./wk.)	3 meals per wk. 0.6 kg/wk. (1.4 lb./wk.)	1 or 2 meals/wk. 0.5 kg/wk. (1 lb./wk.)	None

Children under 15 and women of childbearing age should eat only fish in category.

How much fish you can eat depends on another important factor — how frequently you eat fish. The guide has a secondary table that will help you take that into account.

Which Species Are Tested?

Not every fish species in a lake is tested. Testing one species can indicate the likely test results for another. For example, walleye (yellow pickerel) and northern pike are often tested instead of other sport fish of the same size but positioned lower down the food chain. Walleye and pike are more likely to contain higher levels of mercury — they're the top predators, feeding on smaller fish and absorbing mercury from them.

Testing the top predators, then, reveals the highest mercury level likely to be found in fish in that lake. If low levels are found in the predators, it's probably not necessary to test any other species.

Biologist from Ministry of Natural Resources lake survey team removes a lake trout from the fishing net

Certain species, such as salmon, lake trout, brown trout and smelt, contain high fat accumulations. Organic contaminants — such as PCBs and mirex, which are described later in this chapter — tend to accumulate in fatty tissue. So fish with high fat levels are chosen for testing. If ***they*** don't contain excessive levels of contaminants, then ***less-fatty*** fish from the same lake probably don't need to be tested.

Good Eating

Keep in mind that when fish contain organic contaminants (such as PCBs and mirex) the only part of the fish you should cook and eat is the boneless, skinless dorsal (the area along the spine under the dorsal fin) fillet. Also, women of childbearing age and children younger than 15 years old should ***never*** eat ***any*** contaminated fish.

Here's a look at the major contaminants.

Mercury and DDT

Mercury and DDT were the first substances to be tested under the fish monitoring program; mercury contamination is the main reason for imposing consumption restrictions on Ontario sport fish today.

Mercury is a naturally occurring substance. It's a metal which occurs in low levels throughout Ontario in air, water, rocks, soil and plant and animal matter. Mercury was once widely used in industry, but large-scale use was stopped in the 1960s after high levels were found in fish from Lake St. Clair and the English-Wabigoon system.

In Japan, where incidents of mercury poisoning were documented, people whose bodies accumulated large amounts of mercury were affected by loss of co-ordination and sensory functions; some people died from methylmercury poisoning as their central nervous systems failed.

Today, mercury is still released into the atmosphere as a result of the burning of fossil fuels and of garbage; airborne mercury can travel far from its source to affect lakes a great distance away. High levels of mercury are still found in some fish from some lakes in Ontario, even though mercury has never been directly discharged into those lakes from an industrial source. That's why testing is done on lakes where, seemingly, there is no evidence of industrial contamination.

The amount of mercury found in fish differs with every individual fish — it depends on the type, its age, its place in the food chain and the lake it comes from. You can eat mercury-containing fish, but the allowable amount varies with the level of contamination; when the mercury level is above 1.5 parts per million, you must not eat any at all.

DDT was developed during the Second World War and was widely used later as an insecticide. It breaks down very slowly in the environment. As DDT accumulated in their systems, some fish species nearly lost the ability to reproduce. As a result, the use of DDT was restricted in the 1960s.

Testing indicates concentrations of DDT in fish are now very low and there are no restrictions on eating fish that do contain these limited amounts.

PCBs and Mirex

PCBs and mirex are organic industrial chemicals. PCBs have been given a lot of publicity in recent years as we try to find ways to safely dispose of PCBs and the products that still contain them. Developed in the 1920s, PCBs are very stable and don't break down in the environment; they're also heat resistant, so they were widely used in transformers, hydraulic fluids, oil and grease, fire retardants and paints, inks and adhesives.

PCBs are a concern because they can cause cancer, at least in animals. (There's no conclusive proof that PCBs cause cancer in humans.)

This is one of the chemicals that the fish monitoring program looks for in high-fat fish, such as salmon and lake trout. The PCB concentration can vary greatly even between individual fish. For example, one salmon can have a higher fat content than another — and so may have a proportionately higher PCB concentration than another salmon the same size from the same lake.

Ontario's consumption advisory for PCB-containing fish is based on a federal guideline of two parts per million.

Mirex is a pesticide used in the southern United States; it is not available in Canada. Like PCBs, it accumulates in fatty tissue and breaks down very slowly. It is also a potential cause of cancer.

Mirex concentrations have been found mainly in Lake Ontario fish (principally salmon and trout). The federal consumption guideline is 0.1 parts per million.

Dioxins and Furans

Dioxins and furans (diobenzodioxins and dibenzofurans) are members of two large families of related chemical compounds. One compound, tetrachlorodibenzodioxin (2,3,7,8-TCDD) is considered the most toxic form of dioxin; at even low doses it can cause cancer and impair reproduction in animals.

The Ministry of Environment and Energy tests for this hazardous dioxin and for other toxic forms of dioxins and furans. These other dioxins and furans all have different potencies (50 units of one dioxin may be as toxic as one unit of TCDD). If other dioxins and furans *are* found through testing, a formula is used to convert their potencies into a single number that is the toxic equivalent value of TCDD — that is, the number indicates their overall toxicity as if they were 2,3,7,8-TCDD.

The guideline for fish consumption is 15 parts per trillion.

Should You Eat "Mutant" Fish?

Have you ever pulled a fish out of the water that looked like this: A fish with external growths, tumors, sores, or lesions? Have you hesitated to cook and eat it?

Sport fish may have growths because of viral or bacterial infections. Lymphocytes affect walleye and perch and are very common; they look like cauliflower growths on the skin. Lymphocytes don't kill fish and usually disappear in a year. If you skin and thoroughly cook the fish, it is safe to eat.

Dermal sarcoma is also a viral disease of the walleye that causes growths just under the skin. Again, skin the fish to remove the growths and thoroughly cook the fish.

Lymphosarcoma, a viral disease affecting muskellunge ("muskies") and northern pike, results in thick white patches on the fish's skin. The patches heal to form blotchy red sores, or normal skin. The disease affects the white blood cells and can kill infected fish. But there's no evidence it's a human health hazard — again, just skin and thoroughly cook the fish.

What about parasites you find inside fish when you clean them? It's common to find grubs, worms, cysts or nodules in the intestines, or fungal growths on the body. Common parasites are black spot (in bass and yellow perch), yellow grubs, leeches, lamprey, fish lice and gill flukes. There's no risk to you if the fish is thoroughly cooked.

More for You to Read

To order the publication below, telephone the Ministry of Environment and Energy Public Information Centre in Toronto at (416) 323-4321 or toll-free at 1-800-565-4923. Or telephone the Ministry of Natural Rescources Public Information Centre in Toronto at (416) 314-1177. Please use the Public Information Bank System (PIBS) number to order publications.

Guide to Eating Ontario Sport Fish. Book. Ministry of Environment and Energy/Ministry of Natural Resources. ISSN 0826-9653. PIBS 590b.

More For You To Read

ENVIRONMENTAL LIVING: PROTECTING THE ENVIRONMENT...

VOLUME 1

In Your Home

VOLUME 2

In Your Yard and Garden

VOLUME 3

When Building or Buying Your Dream Cottage

VOLUME 4

At the Cottage

For copies of any of the above-listed volumes, contact:
Ministry of Environment and Energy
135 St. Clair Avenue West
Suite 100
Toronto, Ontario
M4V 1P5

Printed on Recycled Paper

MINISTRY OF
ENVIRONMENT AND ENERGY

Ontario